

## CLAIMS

1. An alkaline earth metal aluminate phosphor containing bivalent europium as an activator,

5 which contains at least one element (e) selected from the group consisting of indium, tungsten, niobium, bismuth, molybdenum, tantalum, thallium and lead.

10 2. The alkaline earth metal aluminate phosphor according to Claim 1,

which is obtained by a process comprising;  
a step (1-1) of firing, in a reducing atmosphere, a mixture of precursor compounds of barium and/or strontium(a), magnesium(b), aluminum(c), europium(d) and at least one element 15 (e) selected from the group consisting of indium, tungsten, niobium, bismuth, molybdenum, tantalum, thallium and lead, respectively, and

a step (1-2) of firing, in an oxidizing atmosphere, the fired product obtained in the step (1-1).

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3. The alkaline earth metal aluminate phosphor according to Claim 1,

which is obtained by a process comprising;  
a step (2-1) of mixing a fired product (A) with a compound 25 (B),

said fired product (A) comprising barium and/or strontium(a), magnesium(b), aluminum(c) and europium(d),

30 said compound (B) being at least one compound selected from the group consisting of indium compounds, tungsten compounds, niobium compounds, bismuth compounds, molybdenum compounds, tantalum compound, thallium compounds and lead compounds; and

a step (2-2) of firing, in an oxidizing atmosphere, the mixture obtained in the step (2-1) or a fired product of the mixture obtained in the step (2-1),

35 said step (2-2) being preceded, at least once, by firing

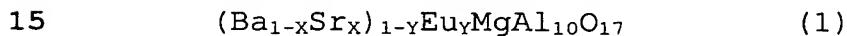
in a reducing atmosphere.

4. The alkaline earth metal aluminate phosphor according to any one of Claims 1 to 3,

5 wherein the content of at least one element (e) selected from the group consisting of indium, tungsten, niobium, bismuth, molybdenum, tantalum, thallium and lead is within the range of 0.0001 to 0.01 mole per mole of the aluminum element.

10 5. The alkaline earth metal aluminate phosphor according to any one of Claims 1 to 4,

wherein the alkaline earth metal aluminate phosphor containing bivalent europium as an activator is represented by the following general formula (1):



in the formula, X satisfies the relationship of  $0 \leq x \leq 0.3$  and Y satisfies the relationship of  $0 < Y \leq 0.2$ .

20 6. The alkaline earth metal aluminate phosphor according to any one of Claims 1 to 5,

which has a powder whiteness of not lower than 85 as expressed in terms of W value.

25 7. A method of producing alkaline earth metal aluminate phosphors according to any one of Claims 1, 4, 5 or 6,

which comprises a step (1-1) of firing, in a reducing atmosphere, a mixture of precursor compounds of barium and/or strontium(a), magnesium(b), aluminum(c), europium(d) and at least one element(e) selected from the group consisting of indium, 30 tungsten, niobium, bismuth, molybdenum, tantalum, thallium and lead, respectively, or a fired product of said mixture.

8. The method of producing alkaline earth metal aluminate phosphors according to Claim 7,

35 which comprises a step (1-2) of firing, in an oxidizing

atmosphere, the fired product obtained in the step (1-1) of firing in a reducing atmosphere.

9. The method of producing alkaline earth metal aluminate phosphors according to Claim 7 or 8,

which comprises a step (1-3) of firing in an oxidizing atmosphere in advance of the step (1-1) of firing in a reducing atmosphere.

10 10. A method of producing alkaline earth metal aluminate phosphors according to any one of Claims 1, 3, 4, 5 or 6,

wherein the method comprises;

a step (2-1) of mixing a fired product (A) with a compound (B),

15 said fired product (A) comprising barium and/or strontium(a), magnesium(b), aluminum(c) and europium(d),

said compound (B) being at least one compound selected from the group consisting of indium compounds, tungsten compounds, niobium compounds, bismuth compounds, molybdenum compounds, 20 tantalum compound, thallium compounds and lead compounds; and

a step (2-2) of firing, in an oxidizing atmosphere, the mixture obtained in the step (2-1) or a fired product of the mixture obtained in the step (2-1),

25 said step (2-2) being preceded, at least once, by firing in a reducing atmosphere.

11. The method of producing alkaline earth metal aluminate phosphors according to Claim 10,

wherein said fired product (A) contains at least one 30 element (e) selected from the group consisting of indium, tungsten, niobium, bismuth, molybdenum, tantalum, thallium and lead.

12. The method of producing alkaline earth metal aluminate phosphors according to Claim 10 or 11,

wherein said firing in a reducing atmosphere is applied to the mixture obtained in the step (2-1).

13. The method of producing alkaline earth metal aluminate  
5 phosphors according to any one of Claims 10 to 12,

wherein said firing in a reducing atmosphere is carried out on the occasion of firing for producing the fired product (A) comprising barium and/or strontium(a), magnesium(b), aluminum(c) and europium(d).